ALTERNATIVE AND COMPLIMENTARY THERAPIES TO MANAGE LABOR PAIN

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Chapter I

Introduction

Introduction

Labor and childbirth can be one of the most stressful times in a woman's life and the need for a supportive and caring environment is well documented. A study completed by McCrea, Wright, and Wright (1999) determined that satisfaction in childbirth is an important indicator of the quality of maternity care given to women today. Quality care is influenced by the nurse's ability to provide holistic options for comfort and dependent upon the patient's perception of the overall birth experience. Holistic care according to Kolcaba (2003) is integration of the patient's physical, psychospiritual, environmental, and social needs to support and achieve comfort. By definition, an alternative therapy is a holistic intervention which promotes a "sense of well-being, sense of control and self-efficacy, healing the person rather than curing the disease, and forming a partnership in which the patient is an active participant" (Creasia & Parker, 2007, p. 371).

As discussed in a study completed by Florence and Palmer (2003) nursing professionals caring for laboring women require evidenced-based knowledge regarding pain management options. Although adequate pain management may be an important aspect of labor and delivery, data obtained in a study by Hodnett (2002) concluded that maternal satisfaction postpartum was far more influenced by whether the actual birth

event met personal expectations. Birth plans are dynamic and influenced by the mother's cultural background, previous experience, communication and support from family and friends, as well as prenatal education (Florence & Palmer, 2003). Based on these personal and cultural beliefs an increasing number of women are looking for alternative methods to deal with the pain and stress associated with labor and birth. The purpose of this study is to examine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor. The study will be an approximate replication of the study completed by Chung, Hung, Kuo, & Huang (2003).

Background & Significance

Touch therapies are used by over 30,000 nurses in hospitals each year and documented as legitimate medical techniques (Keegan, 2001). Acupressure is one form of touch therapy that has been used for over 5000 years. Described by Keegan (2001) as possibly the earliest form of physical therapy, this ancient Chinese technique involves the use of finger pressure along the body's energy meridians in order to regulate the flow of *qi*.

Traditional Chinese medicine focuses on the belief that all life has two parts that must be in balance, the *yin* and the *yang.* The principals of *yin* and *yang* go beyond the Western implications of male versus female; light versus dark; hot versus cold. "*Yin* and *yang* express the idea that everything has a defining link to its surroundings" (Hart & Goh, 1997, p. 17). In other words, the belief that each living and non-living thing exerts an influence on its surroundings to maintain balance, each existing in dependence of one another. Hart and Goh (1997) provide the following analogy, "if one considers the *yin* aspect of a candle to be the wax and the *yang* aspect to be the flame, it is easy to see how

the *yin* nourishes and supports the *yang*, when the wax is gone so is the flame" (p. 18). In regards to health and the body there are five main principles presented by Hart and Goh (1997, p.19):

- All things have a yin aspect and a yang aspect
- Any yin or yang aspect can be divided into another pair of yin and yang aspects
- Yin and yang are mutually dependent. Neither has meaning without the other.
- Yin and yang control each other. Where yin is weak, yang will be strong, and vice versa; where yin is excessive, yang will cause health problems, and vice versa.
- Under certain circumstances yin and yang can transform into each other.

Qi often referred to as c*hi* in Western culture represents the life energy or life force of the individual and is the core concept of traditional Chinese medicine. Traditional Chinese medicine believes that *chi* provides protection from illness. "Described as a mix of inherited energy, passed from parents to children at the time of conception and energy derived from the food and air that sustain us throughout life" (O'Mathúna & Larimore, 2001, p. 144), *chi* is thought to travel along meridians or pathways throughout the body (Fig. 1). Each organ is affected by one of the twelve major meridians which are further grouped into six yin or yang pairs and influenced by the five elements (fire, metal, wood, water, and earth). The six yin organs include the lung, spleen, heart, kidney, pericardium, and liver and the six yang organs include the stomach, small intestine, large intestine, bladder, gallbladder, and triple burner (not an anatomical

organ; it represents the pathway connecting other organs primarily the lungs, spleen, and kidneys). As long as *chi* is flowing uninterrupted through the meridians one is believed to be in good health (O'Mathúna & Larimore, 2001).

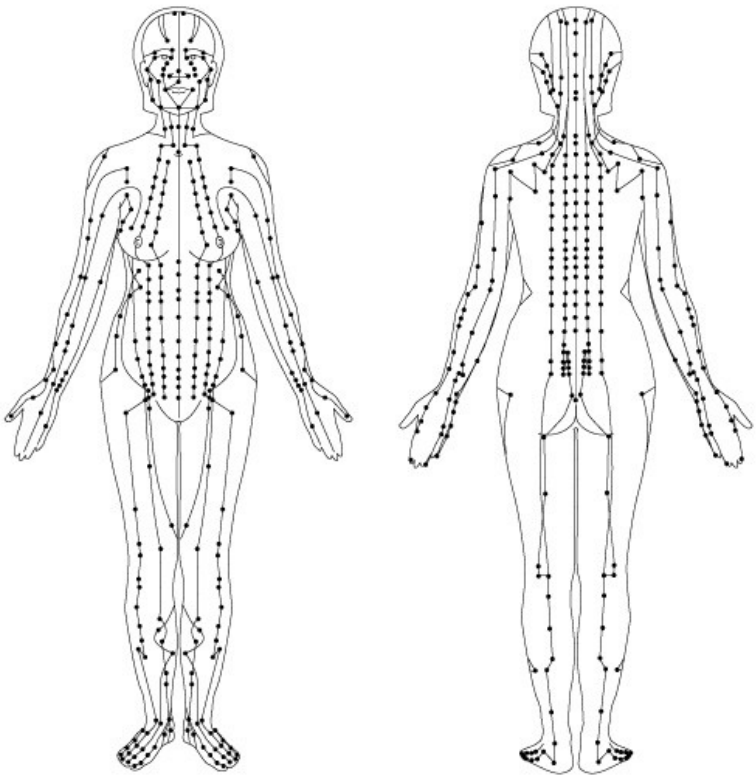

Figure 1. Meridians & Acupoints

In regards to labor pain, "acupressure may stimulate the release of endorphins, blocking pain receptors in the brain, dilating the cervix, and increasing the efficiency of uterine contractions" (Betts, 2003, p.4). By applying strong pressure to the desired acupoint the flow of *chi* is restored promoting relaxation thereby resulting in less discomfort from labor pain. Studies conducted by Chung, Hung, Kuo, and Huang (2003); Lee, Chang, and Kang (2004); Martensson and Wallin (2006); and Hantoushzadeh,

Alhusseini, and Lebaschi (2007) supported the use of either acupressure or acupuncture to diminish labor pain and shorten the duration of labor.

Due to the potential side-effects of pharmacologic treatment modalities for pain on both the mother and unborn child, there is a need for nurses to be knowledgeable of alternative options for pain relief during the labor process (Lee et al., 2004). Comfort is a reoccurring element in nursing care and a main element in the success of alternative therapies. The use of acupressure during the birthing process by nurses may empower patients to achieve a safe non-medicated birth. In addition to potential pain relief and safety the patient may also express a higher sense of satisfaction in regards to the birth experience (McCrea, Wright, & Wright, 1999).

Problem Statement

There is a need for evidence based practice in the area of complimentary or alterative methods of pain management during labor. Labor and delivery nurses need to support and promote the use of these therapies and be knowledgeable of potential benefits. Recent research on labor pain emphasizes the importance of non-pharmacological pain-coping strategies (Chung, Hung, Kuo, & Huang, 2003).

Purpose of the Study

The purpose of this descriptive study is an approximate replication of Chung, Hung, Kuo, and Huang's original study (2003). The study will determine whether similar findings supporting the use of acupressure during the first stage of labor can be obtained.

Research Questions

1. Do women who use an alternative or complementary therapy during labor have less sensation of pain than those who do not?

2. Do women who successfully use an alternative or complementary therapy during labor express fulfillment with their labor experience versus those who did not?

Conceptual Framework

The conceptual framework for this study is the Gate Control Theory (Melzack & Wall, 1965). According to this theory pain signals must pass through a number of "gates" on the way from the area of injury to the brain. Because these gates can only conduct a limited number of impulses stimulation of larger fibers which transmit pain impulses cause the cells in the substantia gelantinosa to "close the gate" thereby diminishing pain perception. Stimulation of the small fibers causes the gate to "open" increasing the perception of pain. Based on this theory, "acupressure creates a competing stimulus that displaces the pain signals and so lessens the awareness of pain" (Hart & Goh, 1997, p. 83).

Definition of Terms

Conceptual Definitions

Labor Pain: "Labor pain is defined as an unpleasant sensory and emotional experience with multidimensional, situation specific factors and varies markedly from woman to woman" (Chang, Chen, & Huang, 2006, p. 190), dependent upon personal and cultural beliefs (Florence et al., 2003).

Alternative Therapy: By definition, an alternative therapy is a holistic intervention which promotes a "sense of well-being, sense of control and self-efficacy, healing the person rather than curing the disease, and forming a partnership in which the patient is an active participant" (Creasia & Parker, 2007, p.371).

Complementary Therapy: A complementary therapy is a non-conventional treatment which enhances traditional Western medicine to promote holistic care of the patient, health, and wellness (O'Mathúna & Larimore, 2001).

Operational Definitions

Visual Analog Scale will be utilized to measure labor pain. An open-ended questionnaire will be used to gather qualitative data in regards to labor pain experienced by subjects (Chung et al., 2003).

Limitations

In replication of the study conducted by Chung et al. (2003) the relatively small sample may influence effect size.

Assumptions

Subjects will be assigned randomly and given the choice to utilize the intervention as a method of pain management during labor. It will also be assumed that women participating in the study will answer honestly concerning the perception of pain management during labor and overall birth experience.

Summary

Based on personal and cultural beliefs an increasing number of women are looking for alternative methods to deal with the pain and stress associated with labor and birth. The purpose of this study is to examine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor. The study will be an approximate replication of the study completed by Chung, Hung, Kuo, & Huang (2003). "Acupressure may stimulate the release of endorphins, blocking pain receptors in the brain, dilating the cervix, and increasing the efficiency of uterine contractions" (Betts,

2003, p.4). By applying strong pressure to the desired acupoint the flow of *chi* is restored promoting relaxation thereby resulting in less discomfort from labor pain. The use of acupressure during the birthing process by nurses may empower patients to achieve a safe non-medicated birth. In addition to potential pain relief and safety the patient may also express a higher sense of satisfaction in regards to the birth experience (McCrea, Wright, & Wright, 1999). Based on the Gate Control theory (Melzack & Wall, 1965), "acupressure creates a competing stimulus that displaces the pain signals and so lessens the awareness of pain" (Hart & Goh, 1997, p. 83).

Chapter II

Literature Review

Introduction

Women who desire to incorporate alternative and complimentary therapies to manage labor pain will find options to be limited within the traditional hospital setting. The purpose of this study is to examine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor. The study will be an approximate replication of the study completed by Chung, Hung, Kuo, & Huang (2003).

Statement of Organization of the Literature

The literature review is divided into four sections:

1. Conceptual framework
2. Alternative and complimentary therapies to manage labor pain
3. Personal control in labor and satisfaction with birth experience
4. Summary

Conceptual Framework

The conceptual framework for this study is the Gate Control Theory (Melzack & Wall, 1965). "The Gate Control Theory for pain is explained as a physiological and psychological process that can be modified by cognitive and behavioral interventions" (Salem, 2004, p.14).

According to the Gate Control Theory, the following three systems interact to produce pain: sensory discriminative, motivational/affective, and cognitive/evaluative. The sensory discriminative system processes information about the severity and spatial aspects of pain. These sensations are regulated through afferent nerve fibers, the spinal cord, brain stem, and the higher brain centers, and result in the pain response. The motivational/affective system develops an individual's learned avoidance behaviors and is regulated by the reticular formation, limbic system, and brain stem. The cognitive/evaluative system overlaps the individual's learned behavior regarding experience to pain and the interpretation of appropriate response to pain. Response to pain is influenced by cultural preferences, gender roles, and past experiences, in addition to other variables such as thoughts and emotions. To explain why thoughts and emotions influence pain perception, Melzack and Wall (1965) proposed that a gating mechanism exists within the dorsal horn of the spinal cord which controls the interactions between these connections and effects when painful stimuli go to the brain. At the tip of the dorsal horn is the substantia gelantinosa, a structure involved in pain transmission. Cells within the substantia gelainosa regulate the transmission of impulses to the central nervous system. Melzack and Wall (1965) theorize that the stimulation of larger fibers which transmit pain impulses cause the cells in the substantia gelantinosa to "close the gate" thereby diminishing pain perception. Stimulation of the small fibers causes the gate to "open" increasing the perception of pain.

Stimulation of the nonnociception fibers by the use of alternative and complimentary therapies interferes with pain messages sent by the large afferent nerve fibers. In turn, descending pathways from the brain close the gate by inhibiting the projector neurons and diminishing pain perception. Therapies which promote interference include guided imagery, breathing techniques, methods that promote relaxation and distraction, acupressure, and acupuncture.

Alternative and Complimentary Therapies to Manage Labor Pain

An increasing number of women are looking for alternative methods to deal with the pain and stress associated with labor and birth. The purpose of the study conducted by Berkland (1997) was to determine whether the use of jet hydrotherapy during labor reduced the need for analgesics. The conceptual framework for this study was based on Watson's theory on the Science of Caring. Berkland (1997) discussed the appropriateness of this theory as it compliments alternative methods of pain management by recognizing the impact of existential phenomenological factors as they relate to health and healing.

This study took place at The Birthplace at Clarkson Hospital, Omaha, Nebraska. Berkland (1997) described the setting as a Labor Delivery Recovery Postpartum unit that promoted unique individualized birth experiences and offered a private jacuzzi in each room.

The target population of the study was pregnant women planning to deliver at The Birthplace. Sample criteria included any stable woman in natural (not induced) labor. Exclusion criteria included any woman under the age of nineteen. The sample size consisted of 42 women of various parity and ethnic backgrounds.

The researcher determined that there were no existing tools that were appropriate to accurately measure the level of pain experienced during labor. A self-report evaluating the participant's accepted methods of pain management both before and after labor via a semantic differential scale was developed for the study.

Berkland's (1997) research focus that hydrotherapy was a safe and effective alternative to pharmacologic pain management of labor, was not supported in regards to pain relief statistically. However, it was noted that only 24% of the experimental group compared to 48% of the control group utilized the more invasive option of epidural anesthesia. Data did support that hydrotherapy was a safe complementary pain management option for laboring women. No significant differences in APGAR scores between the control group and experimental group were noted regardless of the status of membranes (ruptured v/s intact, $p = 0.123$).

Berkland (1997) concluded that the use of hydrotherapy in labor was a safe complementary method that reduced the use of costly epidurals. The results of the study also confirmed IV analgesia was a safe and cost-effective pharmacologic method that complimented the pain relief obtained with hydrotherapy.

Over the past two decades the use of music has become more popular as an intervention for pain in various areas of healthcare. The purpose of Browning's study (2000) was to evaluate the responses of primaparous women to music therapy during labor.

Browning's study (2000) was conducted in Brantford, Ontario, Canada at The Brantford General Hospital. Women attending childbirth education classes were invited to participate.

The target population included pregnant women interested in utilizing music therapy during childbirth. Inclusion criteria for Browning's study (2000) included the agreement to be interviewed prenatally and postpartum. No exclusion criteria were indicated by the author. Eleven women chose to participate in the study.

Browning (2000) interviewed each participant three times during the pregnancy. The purpose of these visits was to establish a therapeutic relationship with each woman, choose music, and discuss methods such as imagery that could be combined with music therapy. Each woman received a tape containing nine hours of music based on preferences discussed during prenatal interviews. Women were encouraged to listen to the music daily. Browning (2000) provided instruction to utilize progressive muscle relaxation and breathing techniques with concentrated, focused listening. The author was present during birth and visited the participant within 72 hours postpartum to conduct an interview regarding therapy. Collected data was noted throughout the prenatal visits, labor, and during the postpartum interview. These responses were then evaluated by the author in a phenomenological manner.

Browning (2000) evaluated the type of music utilized, how music therapy was useful during labor, and how it assisted with imagery. All women responded that the rhythm and tempo of the music was appropriate for labor. All women reported using the music for distraction and relaxation. Most of the women indicated that the music therapy assisted with imagery and cued breathing patterns.

Browning (2000) concluded that all music utilized during labor should be chosen by the mother and be listened to frequently prior to labor to promote familiarity. Multiple

types of music should be utilized to avoid boredom and the laboring woman should guide care providers during music therapy to promote a positive birth experience.

Complementary and alternative methods of managing labor pain are becoming more accepted and sought as healthcare focuses on providing culturally sensitive and individualized care. The purpose of the Chang, Chen, and Huang study (2006) was to describe the characteristics of pain during labor with and without massage. No specific framework was identified in the study.

The Chang et al. study (2006) took place at an undisclosed medical center in Southern Taiwan. The target population consisted of laboring women that presented to the medical center. Sample criteria included married primaparous women in active labor with no anticipated medical complications. The participant group for the Chang et al. study consisted of 60 women ages 20-39.

Chang et al. (2006) utilized the Short-Form McGill Pain Questionnaire (SF-MPQ) to measure the laboring women's response to pain. The SF-MPQ consists of a series of questions regarding different aspects of reported pain and includes a Present Pain Intensity index and Visual Analogue scale (VAS).

Chang et al. (2006) utilized a two-sample t-test to compare differences in labor pain between the massage and control groups. Data analyses were carried out using the Statistical Software Package for the Social Services (SPSS), version 10.0. Mean VAS scores were found to be significantly different between the massage group and the control group for phase 1 and 2 of labor, but not phase 3. In addition, there were several significant differences between the two groups in relation to several categories of the SF-MPQ.

As labor progressed the pain intensity increased significantly for all women participating in the study. Chang et al. (2006) noted that data did support the use of massage in the 1st and 2nd phase of cervical dilation and was a cost-effective non-pharmacologic intervention, especially among cultures where analgesics are not the primary choice for pain relief. The researchers suggested further studies involving multiple sites and duplication in different countries would further validate the research findings.

The benefits of laboring naturally without pharmacologic intervention for pain are well documented. However, there is limited research available on the effectiveness of non-pharmacologic coping strategies during labor. The purpose of the Chung, Hung, Kuo, and Huang study (2003) was to determine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor. The conceptual framework is the Gate Control Theory (Melzac & Wall, 1995).

The study took place at a birthing center in Taiwan over a six month period. Participants of the Chung et al. study (2003) were placed into three groups: effleurage, control, and acupressure by blind study. The target population included women presenting to the birthing center. Sample criteria for the Chung et al. study (2003) included an estimated gestational age between 37 and 42 weeks, no high-risk pregnancy conditions, mothers carrying one fetus, and those able to interact verbally in Chinese. Exclusion criteria included women who received medication during labor such as induction by oxytocin, anesthesia for a cesarean section, or an epidural block.

Chung et al. (2003) utilized the Visual Analog Scale (VAS) to measure the sensation of pain. Uterine contractions were evaluated from fetal monitor strips via the

use of an external tocodynamometer monitor. A scale of 1-10 was used to quantify the intensity of pain. An open-ended questionnaire was used to gather qualitative data about labor pain experienced by subjects.

Chung et al. (2003) collected data to determine if LI4 and BL67 acupressure could provide relief of labor pain. This data supported that the acupressure group experienced the most labor pain relief out of the three groups during the active phase of labor. The remaining research question, does LI4 and BL67 acupressure enhance contractions, was inconclusive.

Results of the Chung et al. (2003) study confirmed the effect of LI4 and BL67 acupressure for labor pain relief during the active phase of labor. However, data did not support any effects on uterine contractions.

Pharmacological interventions can cause complications for the laboring mother and her fetus. Bathing in warm water has been reported to be an effective option for pain relief for the laboring woman. The purpose of the study conducted by Eckert, Turnbull, and MacLennan (2001) was to compare immersion in warm water during labor with traditional pain management for a range of clinical and psychological outcomes.

The Eckert et al. trial (2001) was conducted from May 1995 thru September 1998 at Women's and Children's Hospital located in Adelaide, South Australia. Two-hundred and seventy-four women participated in the study; 137 in both the bath group and control group.

The target population included pregnant women expecting to deliver a term singleton pregnancy at the hospital. Inclusion criteria for the Eckert et al. (2001) study consisted of a pregnancy free of medical and obstetrical complications. Exclusion criteria

included labor before 37 weeks gestation, delivery by cesarean section, continuous electronic fetal monitoring, history of positive group beta strep culture, or the immediate use of IV pain medication or epidural soon after admission.

Data was collected by the hospital's midwives. Eligible women who expressed an interest in having the option to bathe during labor enrolled in the antenatal clinic between 28-32 weeks gestation after informed consent was provided. Upon admission for delivery assignment to either the bath group or non bath group was determined by a restricted randomized scheme developed from random number tables. Data for the Eckert et al. (2001) study was obtained by questionnaire. The first questionnaire was collected 24-48 hours after delivery and measured perceptions of pain, expectations of labor and delivery, and satisfaction with care and treatment allocation. The second questionnaire reassessed the same topics eight to nine months post delivery with the addition of postnatal distress. Perceptions of pain and expectations of labor and delivery were measured using a Visual Analog Scale that ranged from zero at the far left of the scale (negative) and to 100mm at the extreme right (positive). Postnatal distress was measured using the Edinburgh Postnatal Depression Scale.

Ninety percent of women in the bath group and 83% in the routine care group returned the first postnatal questionnaire. Seventy percent of women in the bath group responded to the second questionnaire compared to 66% in the routine care group. Neither group in the Eckert et al. (2001) study demonstrated a difference in the amount of pharmacological analgesia. There were also no significant differences noted between groups in regard to the number of women who required induction or augmentation of labor. The degree of perineal trauma experienced and the duration of labor also remained

similar between both groups. No statistically significant report of maternal infection was noted. In addition, participants in the bath group as well as the routine care group expressed similar levels of satisfaction with care and the degree of postnatal distress experienced. A significant increase in the use of positive pressure ventilation to resuscitate the neonate was noted among the bath group (RR 1.41, 95% CI 1.06-1.89, p=0.01).

No data supported the use of bathing as a beneficial non-pharmacologic intervention for labor pain. However, Eckert et al. (2001) noted that water temperature was monitored inconsistently by the midwives which may have contributed to the significant increase in the number of neonates which required resuscitation in the bath group.

The benefit of acupuncture as an intervention for pain management continues to be supported by research and clinicians. The purpose of the study conducted by Hantoushzadeh, Alhusseini, and Lebaschi (2007) was to assess the effects of acupuncture on primaparous women during childbirth with a concentration on pain, labor duration, and maternal acceptability.

The Hantoushzadeh et al. study (2007) took place in Iran at a hospital near the city of Tehran. Data was collected over an eight month period from February thru September 2005.

During the eight month trial conducted by Hantoushzadeh et al. (2007), 150 consecutive nulliparous women meet the inclusion criteria and were invited to join the study. Inclusion criteria consisted of a term singleton pregnancy greater than 37 weeks gestation, nulliparity, and spontaneous labor. Exclusion criteria included medical or

obstetrical complications, cesarean section, and cervical dilation greater than 6cm upon admission. Participants were randomly assigned to either the experimental group or control group. Active labor was defined as cervical dilation equal to or greater than 4 cm and three contractions lasting 40 seconds or longer during a ten minute period.

Hantoushzadeh et al. (2007) assigned data collection to the midwife caring for the laboring woman. Patients were unaware of their specific assignment. The experimental group received acupuncture to treat pain. The control group received minimal acupuncture which was explained as needles inserted in places that are not regarded as acupoints. The severity of pain or discomfort was measured using Visual Analog Scale. A color gradient was used on the scale ranging from yellow to red. The far left was the yellow end and indicated no pain (0) and the far right was represented in red and indicated severe pain (100mm). Data was collected upon admission, 120 minutes after admission, and every hour thereafter until delivery. Mothers where then interviewed postpartum in regards to satisfaction with their treatment and willingness to receive treatment in the future for pain during childbirth.

Of the 150 women participating in the Hantoushzadeh et al. (2007) study, 70 received real acupuncture and 74 received minimal acupuncture. None of the patients refused treatment. Six patients were disqualified from the study due to the need for cesarean section. None of the patients refused the intervention. Patients in the experimental group experienced a shorter active phase of labor (mean 3.41) compared to the control group (mean 4.45) $p < 0.001$. Effectiveness of the intervention for pain relief was also significantly higher among patients in the experimental group with 38 participants rating acupuncture as a very good intervention compared to 5 patients in the

control group p>0.001. 95% of patients stated a willingness to utilize the intervention for future labors; whereas, only 73% of the control group where willing to reuse the intervention (p >0.001). The main finding of the Hantoushzadeh et al. (2007) study was that the use of acupuncture is a safe and effective intervention for pain that also significantly reduces the length of the active phase of labor.

Due to the potential side-effects of analgesics and anesthetic agents on mothers and fetuses, there is a need for nurses to be knowledgeable of nonpharmacologic pain relieving measures during the labor process. The purpose of the study conducted by Lee, Chang, and Kang (2004) was to evaluate the effects of SP6 acupressure on both labor pain and the duration of labor.

The study took place at an unspecified university hospital. Lee et al. (2004) recruited potential participants by direct announcement and poster presentation located in the hospital's outpatient services area over a five month period in 2002.

The population for this study consisted of pregnant women due to deliver from May to September 2002. Sample criteria for the Lee et al. study (2004) included women 37 weeks gestation with a non-complicated singleton pregnancy with an anticipated vaginal delivery. Participants were randomly assigned to either the experimental group or control group. The experimental group received SP6 acupressure and consisted of 36 women. The control group received SP6 touch and consisted of 39 women.

To control bias in data collection, Lee et al. (2004) arranged for all data to be collected by nurses that were blinded to the patient's group assignment. Patients were also blinded to group assignment. Subjective pain measurements were obtained using a

horizontal visual analog scale with ratings from 0-10; higher numbers indicated a more intense feeling of pain experienced by the patient.

Data collected by Lee et al. (2004) found no significant differences of subjective labor pain at base line. There were significant differences between the intervention ($F=6.46$, $p=0.012$); 30 minutes after intervention ($F=5.5657$, $p=0.021$); and 60 minutes after intervention ($F=6.733$, $p=0.012$). Duration of labor among the experimental group was also noted to be shorter ($t=2.864$, $p=0.006$). There was no significant difference in the level of anxiety between the two groups prior to the intervention. However, anxiety levels were noted to be less in the experimental group after acupressure was performed.

In conclusion the findings reported by Lee et al. (2004) indicated that 30 minutes of SP6 acupressure was an effective complementary treatment for pain relief during labor which significantly reduced the active stage of labor. The researchers concluded further studies were necessary to understand whether the same findings could be replicated among a larger population.

In Swedish delivery wards the desire to use alternative methods for relaxation and pain management in addition to pharmacologic options has steadily increased over the past two decades. More women desire to labor naturally and even reject medications due to the potential negative side effects. Martensson and Wallin (2006) evaluate the use of acupuncture and sterile water injections for labor pain and why there has been an increase in the use of acupuncture and a decrease in sterile water injections over time.

Martensson and Wallin (2006) conducted the study in various unspecified maternity wards in Sweden during 2004 and 2005. The target population consisted of 960 midwives practicing in Sweden who met the following criteria: actively working on a

delivery ward and having received formal acupuncture training. Of the 960 midwives meeting the requirements, 565 chose to participate in the Martensson and Wallin (2006) study.

Data was collected via a questionnaire developed by Martensson and Wallin (2006) and consisted of 34 questions. Topics on the questionnaire included: delivery ward experience, any education in addition to midwifery training, when to use sterile water injections or acupuncture, how to use acupuncture and familiarity with general recommendations concerning the methods and basis for information about the methods given to the laboring woman and her partner.

Martensson and Wallin (2006) addressed why the clinical use of acupuncture was more widely utilized than sterile water injections during labor. Descriptive statistics and percentages were utilized to evaluate data. The sign test was applied for comparison of the two interventions and probability of which intervention was utilized for either back pain, abdominal pain, and/or inguinal pain. Acupuncture was the first choice for relaxation among 68% of the participating midwives. Only 0.8% of the midwives utilized sterile water injections for relaxation. Use of only sterile water injections for pain was very low with nearly all midwives using a combination of both acupuncture and sterile water injections for pain relief. 44% of the midwives indicated familiarity with the general recommendations for use of acupuncture and only 11.6% indicated knowledge of general recommendations for the use of sterile water injections.

Nurse midwives in Sweden used acupuncture for both relaxation and pain relief; whereas, limited use of sterile water injections were used almost exclusively for pain relief. The results of the study indicated a weakness in the midwives' awareness of

scientific knowledge and general recommendations about these methods (Martensson and Wallin, 2006).

Salem (2004) described labor pain as one of the most painful experiences of a woman's life. Pharmacologic methods for pain management during labor are not always an option. The purpose of this study was to evaluate the use of music as an intervention for pain management among women during the first stage of labor. The conceptual framework is the Gate Control Theory (Melzac & Wall, 1965). This study took place in Egypt at El-Shatby Maternity Hospital on the antenatal unit. Women labored in the same room with only a curtain for privacy.

The target population consisted of laboring women who had no access to epidural anesthesia due to cost. Sample criteria included primaparous women admitted with a cervical dilation less than 3 centimeters, normal term gestation, regular uterine contractions, fetal descent of the presenting part, and the ability to speak fluent Arabic. Exclusion criteria included medical complications of pregnancy, planned Cesarean Section, multiple gestation, absent fetal heart tones, cognitive disability, and/or prenatal education such as classes or pain management techniques. The sample size included 74 women between the ages of 20 to 35 (Salem, 2004).

To measure the sensation of pain and level of anxiety Salem (2004) utilized the Sensation of Pain Visual Analog Scale (VAS). Subjects were asked to place a pencil mark on a 10cm horizontal line; this mark was to represent the level of pain and anxiety felt after each contraction.

Salem (2004) addressed the following research questions in the study: Do women who use music during the first stage of labor have less sensation of pain than those who

do not? Do women who use music during the first stage of labor have less anxiety of pain than those who do not? Fifty-one percent of the test subjects in the music group indicated that they utilized the music to distract them from the pain and relax before and during contractions. Thirty percent indicated that music was only used to relax in between and during contractions and nineteen percent only used the music as a distraction from the contractions. Ninety-two percent of the subjects agreed that music did help to reduce the pain while the remaining eight percent were undecided. Data indicated that the music group indicated less anxiety and pain overall in comparison to the control group during the first stage of labor. Clinical significance of the results was reported to be modest with only a 7% to 16% less pain and anxiety experienced between the control group and the experimental group. The researcher noted this is due to the subjective nature of pain and individual variation. Salem (2004) concluded that women who used music had significantly less sensation and anxiety of pain than those who did not.

Personal Control in Labor and Satisfaction with Birth Experience

A study conducted by Heinze and Sleigh (2003) hypothesized that women who chose not to utilize an epidural would score higher on a scale measuring knowledge of maternal and infant side effects related to its use. The purpose of the study was to evaluate the differences between women who labor with or without epidural anesthesia. In their review of the literature the researchers found the control of the childbirth experience was dependent upon choices made by the mother during labor. In the United States the epidural had been cited as the most widely used method of pain relief despite the risk of adverse side effects to the mother and infant. A study conducted previously by Poore and Foster in 1985 found that women who chose not to use an epidural during

childbirth were more knowledgeable about the risks associated with epidural use, and were more active during the birth experience, demonstrating personal control and participation.

The study completed by Heinze and Sleigh (2003) was conducted via the internet at a large mid-Atlantic University. After permission was received from a popular pregnancy website, an invitation to join the study was posted to the forum.

The target population consisted of women who had delivered within the six months prior to participating. Inclusion criteria included vaginal delivery. Exclusion criteria included cesarean section. Forty-six women chose to participate in the study.

A three part survey was utilized to collect data during the study. The survey was distributed to participants via email. The first part of the survey gathered demographic data. The second portion was a previously published scale, The Utah Test for Childbearing Year: Beliefs and Perceptions about Childbearing. The start of this portion of the survey assessed fear of the childbirth process, the second portion measured the tendency to seek external guidance rather than internal answers, and the final portion of the second section assessed a woman's desire to be actively engaged in the childbirth experience. Heinze and Sleigh (2003) modified the original scale from 'agree' or 'disagree' format to a 1-5 Likert scale of 'strongly disagree' to 'strongly agree' with 'neutral' as the middle response. The final part of the survey evaluated the women's knowledge of potential side effects of epidural use. Data was collected by asking the women to label statements about epidural use either 'true' or 'false' and by indicating which of 17 side effects had been linked to epidural use. Women earned 1 point for each correct answer resulting in a score from 0-28.

Of the participants in the study 26 women received an epidural and 20 did not. Across the four scales a MANOVA was used to compare scale means for women who received an epidural to those who did not. Three of Heinze and Sleigh's (2003) hypotheses were supported. Women who received an epidural were observed to have a significantly higher fear of childbirth (7.13, $p<0.05$) and higher passive compliance (10.91, $p<0.01$). Women who received an epidural also demonstrated dependence on others and a decrease in personal control (11.84, $p<0.01$). Ninety-one percent of the women surveyed were satisfied with the decision to use an epidural. The hypothesis that women who did not receive an epidural were more knowledgeable about the potential side effects of epidural use was disproved with the mean score of knowledge among epidural users at 18.70 and the mean knowledge score among non-users at 15.73.

The use of epidurals for pain during childbirth has a significant correlation to fear and lack of active participation during the birthing process. Women in this study who chose not to utilize an epidural for pain control commented on the lack of support received by care providers. In addition, the lack of non-pharmacologic pain management options available to laboring women was discussed by Heinze and Sleigh (2003). The researchers concluded that additional study was warranted on the degree of support given to the laboring woman who chooses to forego an epidural. They also advocated for the further review of non-pharmacologic methods for managing pain during labor.

The purpose of the McCrea, Wright, and Wright study (1999) was to examine the influence of personal control on women's satisfaction with pain relief during labor. A review of the literature revealed pain relief is characterized by the way in which women

manage labor pain and satisfaction with pain relief is influenced by individual and environmental factors.

The study conducted by McCrea et al. (1999) took place at a large teaching hospital in Northern Ireland. The reported annual birth rate of the hospital was approximately 3,000 births per year.

The target population consisted of pregnant women who delivered during the data collection period. The midwife manager of the maternity unit assisted with obtaining the consent of 146 women to participate in the study. Inclusion criteria included birth by vaginal delivery. Exclusion criteria for the McCrea et al. study (1999) included birth by cesarean section. As a result, 46 women were excluded from the study.

McCrea et al. (1999) developed a questionnaire to explore three sets of variables related to satisfaction which included: demographic data, expectations of labor pain, and the third section consisted of a modified version of the Personal Control Scale which was utilized to evaluate the women's perceived control in managing labor pain. The original Personal Control Scale evaluated women's expectations of labor pain and the anxiety experienced in anticipation of pain using Visual Analog Scale in combination with a seven point Likert scale to evaluate satisfaction with the method used to manage pain. McCrea et al. (1999) developed a five point scale which ranged from (1) very painful/worried to (5) not at all painful/worried to evaluate the anticipation of labor pain and a seven point scale to evaluate the effectiveness of management and personal control with (1) representing very dissatisfied and (7) representing very satisfied. A third scale, the Visual Analog Scale, was also used in the study. This scale was used to evaluate personal control of pain relief.

McCrea et al. study (1999) focused on whether or not personal control during labor correlated with women's satisfaction of pain relief. All dependent and independent variables were measured on ordinal scales and were analyzed using parametric tests including Pearson's correlation. An independent t-test was performed to examine the difference between primagravidae's and multigravidae's reported satisfaction with pain relief. Of the women participating in the study, 36 were primagravidas and 32 were multigravidas. The majority of the women were married. All participants were Caucasian and resided in Northern Ireland. The majority of women indicated on the Personal Control Scale that labor was expected to be 'quite painful' and noted being 'worried'. The majority of women also indicated that exercises learned in antenatal education courses promoted control. The participants also found the courses useful. Data also supported that personal control was an important factor which could influence satisfaction with overall pain relief.

McCrea et al. (1999) suggested that there was a significant relationship between personal control variables and pain relief. The researchers noted the importance of emphasis being placed on the value of a woman's own coping mechanisms versus pain medication and the resulting correlation of satisfaction with pain relief and overall birth experience.

Pharmacological methods carry a risk of adverse side effects and varying degrees of efficacy. The purpose of the study conducted by Peart (2008) was to investigate whether intradermal sterile water injections provided an alternative method to managing labor pain that may have fewer side effects.

Peart's study (2008) was conducted at two Victorian Regional hospitals located in Colac and Horsham, Australia during 2003 and 2004. The target population consisted of pregnant women who planned to deliver at one of the two hospitals where Peart (2008) was conducting the study. Participants were recruited during pregnancy at each location. The intervention was discussed and a video was shown to potential participants demonstrating the procedure. A total of sixty women agreed to participate, 30 at each location. Inclusion criteria included back pain during labor. No exclusion criteria were noted by the author.

Data was collected during labor by the Visual Analog Scale (VAS). Participants experiencing back pain indicated severity of pain on the VAS prior to intervention. A second measurement of pain was taken five minutes post intradermal injection and every 30 minutes thereafter up to 3 hours. Two midwives trained in the technique simultaneously injected sterile water intradermally to reduce discomfort of the participant. Four sites located in the Michaelis Rhomboid or lumbar-sacral region of the spine were injected. In addition, data was collected via two postpartum surveys developed by Peart (2008). The questionnaires reviewed demographic and qualitative data. A total of 52 surveys were returned (87%).

Sixty-three percent of the women participating in the study were primagravidas under the age of 30. A slightly higher rate of vaginal delivery (69%) was noted among the participant group compared to the state average of 58%. All women participating in the study conducted by Peart (2008) viewed the intervention as harmless and safe for the unborn child. Three quarters of the women reported that sterile water injections provided immediate relief of back pain, and 90% reported a reduction in back pain five minutes

following the injection of sterile water. Overall, 90% of the participants reported to be satisfied or very satisfied with the intervention as a safe alternative to pharmacologic intervention for pain relief.

Intradermal sterile water injection is a safe and effective non-pharmacologic intervention for back pain during labor based on the data collected by Peart (2008). Peart further indicated education was required among practitioners to support the use of sterile water injections among laboring women.

The purpose of the study conducted by Carlton, Callister, and Stoneman (2005) focused on factors which influence a woman's decision making process during labor, and which of these factors promote a successful non-medicated birth and/or a change of preference to a medicated birth. Prior research had revealed the decision-making process for laboring women can raise ethical dilemmas related to care when the patient chooses to deviate from the original birth plan. Carlton et al. (2005) developed a framework based on the decision making process during labor, represented by an algorithm.

This study took place at three different birthing units located in the western United States. Carlton et al. (2005) described the setting as birthing units that had anesthesia services available at any time of the day or week.

The target population consisted of women admitted to the various birthing units in active labor. Sample criteria for the Carlton et al. (2005) study included women delivering term infants vaginally who desired to have a non-medicated birth or expressed a "wait and see attitude". The sample size consisted of 33 women of various parity and ethnic background.

Data collection and analysis for the Carlton et al. study (2005) proceeded concurrently via interview. Interview questions covered why the woman desired a non-medicated birth or demonstrated a "wait and see" attitude as well as a question that reviewed how a change to a medicated birth made the woman feel once a deviation from the original birth plan occurred. Data collected was put into Ethnograph V.5 format.

Carlton et al. (2005) evaluated which factors may change the original birth plan; specifically a change from a non-medicated birth to a medicated birth. The participants of the study expressed feelings of disappointment, ambivalence, and satisfaction as a result of changes to the original birth plan. However, all of the women agreed that the most important aspect of a change to the birth plan was a healthy newborn and this overshadowed any disappointment or doubt. Data collected during interviews also indicated that these women were affected by the role of the nurse and the nurse's degree of participation during the birth.

Carlton et al. (2005) concluded that the obtained data would allow nurses and other care providers to be better informed and prepared to provide positive quality support during labor; promoting a positive birth experience.

Summary

Various studies reviewed provided information on the safety, efficacy, satisfaction, and cost-effectiveness of alternative and complimentary therapies for pain relief during childbirth. While interventions such as hydrotherapy, acupressure, acupuncture, music, massage, guided imagery, and breathing techniques are not new discoveries, the wide use of epidurals to manage pain has cast a shadow over past use deeming them alternative methods.

With the exception of hydrotherapy these methods have been proven to be safe for both the mother and unborn child. While hydrotherapy is of popular interest among women planning a non-medicated birth, it continues to be controversial in regards to conclusive data supporting safety. The study presented by Berkland (1997) supported the safety of hydrotherapy finding no significant differences in maternal or newborn outcomes compared to women who chose an epidural to manage pain. In contrast Eckert et al. (2001) reported an increased incidence of positive pressure ventilation among newborns delivered to mothers who utilized hydrotherapy. Other issues regarding the use of hydrotherapy are the need to monitor water temperature frequently since maternal fever can result in fetal distress and the limited availability of tubs on labor and delivery units. There is clearly a need for further study in regards to this treatment and safety.

Both acupressure and acupuncture are reported to have been used for pain management for over 2000 years according to Traditional Chinese medicine (O'Mathúna & Larimore, 2001) and remains popular in cultures where the use of pharmacologic treatment of labor pain is less favored. Chung et al. (2003) provided data that acupressure significantly reduced labor pain. Lee et al. (2004) was able to produce the same results for pain relief in addition to data supporting that acupressure significantly reduces the active stage of labor. Acupressure is a very low cost intervention that could be provided by a support person or healthcare provider with no adverse side effects.

Martensson and Wallin (2006) supported the effectiveness of acupuncture to promote relaxation and pain management. Research indicated a need for knowledge regarding therapy and an increase in willingness by healthcare providers to implement a non-pharmacologic intervention to manage labor pain. In addition Hantoushzadeh et al.

(2007) reported the success of acupuncture for diminishing labor pain and benefits associated to a shorter duration of the active phase of labor. Sterile water injections for the treatment of back pain during labor are also safe and effective according to recently completed research by Peart (2008) and may be used simultaneously with acupuncture depending on the practitioner's preference. Although acupuncture is clearly an evidence-based practice training is required to implement the intervention successfully which may limit availability in the United States.

Heinze and Sleigh (2003) discussed the correlations between epidural use and active participation in the labor process by the patient. Noting that in the United States epidural anesthesia is the most widely utilized method for pain relief despite associated risks. In addition, births contain multiple medical interventions such as continuous monitoring and limited ambulation during labor which conflict with evidenced based knowledge regarding labor processes. According to findings by McCrea et al. (1999) fear of pain seemed to be a major influence in a woman's decision to receive an epidural. In western culture a patient desiring a non-medicated birth often faces a lack of support from both care givers and loved ones in regards to laboring naturally. Carlton et al. (2005) found that this lack of support led to a significant increase in a deviation from the patient's original plan to labor without pharmacologic intervention and resulted in feelings of disappointment and decreased satisfaction in the overall birth experience.

As discussed according to Melzack and Wall (1965), any stimulation of the large afferent nerve fibers close the 'gate' in the substantia gelainosa. Based on this theory any therapy that promotes relaxation and distraction can diminish the pain response. When methods such as acupuncture, sterile water injections, or hydrotherapy are not available,

women may consider the use of music, guided imagery, massage, and breathing techniques such as Lamaze to manage the pain of labor. Chang et al. (2006) outlined the benefits of massage during the first and second phase of labor and noted the decrease in pain sensation experienced compared to women who chose no intervention for pain. Salem (2004) explained that although women who utilized alternative methods such as music therapy experienced a high level of discomfort with labor, data suggested that the level of pain and anxiety experienced was significantly less than those who did not. Similar findings were reported by Browning (2000) who also emphasizes the importance of the mother being actively involved in choosing the music and changing tempo as needed to promote relaxation and ultimately a positive birth experience.

Chapter III

Methodology

Introduction

There is a need for evidence based practice in the area of complimentary or alterative methods of pain management during labor. Benefits of the use of acupressure have been documented for labor pain relief. The purpose of this study is to examine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor and to verify the findings of the study completed by Chung, Hung, Kuo, & Huang (2003). The Gate Control Theory for pain (Melzack & Wall, 1965) will provide the conceptual framework for the study. This chapter will present the population and sample setting of the study; discuss the protection of human subjects; evaluate the procedures for collecting data and the methods of measurement; and outline the research design and intended method for data analysis.

Research Questions

1. Do women who use an alternative or complementary therapy during labor have less sensation of pain than those who do not?
2. Do women who successfully use an alternative or complementary therapy during labor express fulfillment with their labor experience versus those who did not?

Population, Sample, Setting

The target population consists of pregnant women planning a natural birth experience. Natural in this case is defined as childbirth without the use of narcotics or epidural anesthesia to control pain. The anticipated sample will include 150 primaparous women admitted to the unit of Labor and Delivery at Home Hospital in Lafayette, Indiana. Home Hospital currently performs approximately 3,000 live births annually. Inclusion criteria for the study will include term singleton pregnancy free of medical or obstetrical complication. Exclusion criteria will include delivery by cesarean section or the use of medications such as oxytocin or epidural block during labor. Women will be recruited to participate in the study based on personal interest and the desire for a natural birth experience at local prenatal courses held at the Kathryn Weil Center for education operated by Home Hospital.

Protection of Human Subjects

Permission will be obtained from the Institutional Review Board of Ball State University and the participating agency. To ensure protection of human rights women interested in participating in the study will be provided informed consent verbally and in print. Right to confidentiality, right to withdrawal, and potential benefits to the participants will be discussed. No risks to the laboring woman or the unborn child have been identified. Information on the purpose and nature of the study will be provided and permission to observe and collect data during the woman's labor and birth will be requested in writing. Upon consent to participate each subject will be given a cover letter and abstract in addition to copies of the data collection tools.

Procedures

Upon IRB approval a meeting with the Chief of Obstetrics, Director of Maternal Child Health, and the Department Director of Labor and Delivery/Postpartum units will be arranged to discuss the purpose of the study and role of the institution. During the meeting the researcher will assume sole responsibility for performing the experimental intervention and provide documentation supporting proper training. In addition potential benefits will be reviewed and the researcher will stress patient confidentiality, the voluntary nature of the study, and right to withdraw. There are currently no identified risks to present. A second meeting will be scheduled to discuss the intention of the study with staff nurses on the Labor and Delivery unit and the unit secretaries of the postpartum unit. During this meeting the researcher will present the visual analog scale (VAS) that will be utilized to collect data in regards to intensity of pain as well as a questionnaire which will be distributed by the researcher post delivery. Instructions will be provided on the correct method of gathering data and collection of the completed postpartum questionnaire by the unit secretaries. Staff will be encouraged to express any questions or concerns and the researcher will repeat the importance of supporting the client's decision to forego traditional methods of pain management such as the epidural.

Instrumentation

VAS will be utilized to measure the sensation of pain experienced by the subject. Uterine contractions will be evaluated from fetal monitor strips via the use of an external tocodynamometer monitor. To evaluate the subjects overall satisfaction with birth experience an open-ended questionnaire will be used to gather qualitative data.

The VAS measures the patient's subjective sensation of the identified stimuli. A 10cm line that may be presented either vertically or horizontally ends with bipolar anchors that represent each extreme of the stimulus/stimuli which in the case of this study is pain. The patient indicates the intensity of pain by placing a mark on the line between the two descriptors. A ruler is used to measure the distance between the left end of the line and the subject's mark which denotes the value of the stimulus (Burns & Grove, 2003). An example of the VAS to be utilized for this study is shown in Figure 2.

Figure 2. Visual Analog Scale for Pain Assessment

Reliability and validity of data collection tools for measuring the intensity of labor pain are often debated due to the fact that the sensation is multifactoral. Many studies, including several cited in the literature review have successfully utilized the VAS to evaluate labor pain due to its simplicity and efficiency (Chung et al. 2003; Eckert et al. 2001; Hantoushzadeh et al. 2007). Ludington and Dexter (1998) noted that although the VAS may not be a perfect tool for data collection, it is likely accurate and easy to evaluate. Winkelman, Norman, Maloni, and Kless (2008) compared the VAS to the dermatome assessment as a method to evaluate pain among laboring women and reported that although both measures of pain attempt to capture sensation of pain, the VAS is

based solely on the patient's perception and can be influenced by culture, age, and situational factors.

An external tocodynamometer will be used to measure the force and frequency of uterine contractions. The use of external fetal monitoring is a common obstetric practice in American hospitals. During the procedure an external tocodynamometer is placed on the abdomen, this pressure sensitive button monitors myometrial contractility by a change in shape of the uterus (Bakker, Van Rijsiwijk, & Van Geijn, 2007). Uterine activity is simultaneously recorded onto fetal monitoring strips via a Montevideo Unit. Units available on the Labor and Delivery unit of Home Hospital for external tocography (ET) are manufactured by GE (Core Metric series 120). Bakker et al. (2007) noted that although ET is not as reliable as internal tocography (IT) via an internal uterine pressure catheter for measuring the adequacy of uterine contractions, ET is a noninvasive and readily available method which can accurately determine contraction frequency. Normal progression of labor and cervical dilation will quantify adequate contractions for the purpose of this research.

An open-ended questionnaire will be used to gather qualitative data in regards to labor pain experienced by subjects (Chung et al., 2003). The questionnaire will allow for collection of data in regards to the subject's opinions, attitudes, and beliefs about the intervention. To protect validity of the instrument the questionnaire will only consist of two questions. A study conducted by Hardin and Buckner (2004) successfully utilized an open-ended questionnaire to record qualitative data in regards to birth experience and satisfaction further validating the study conducted by Smith, Collins, Cyna, and Crowther (2006) which promoted the use of alternative pain-management practices to ease labor

pain. For the purpose of this study the following two open-ended statements will be addressed:

1. Tell me about your labor experience.
2. Describe the care you received.

Research Design

An experimental design will be used for this study. According to Burns and Grove (2003) experimental studies are "objective, systematic, and highly controlled for the purpose of predicting and controlling phenomena in nursing practice" (p. 28). In addition, three essential characteristics of experimental research include controlled manipulation of at least one treatment variable, exposure of remaining subjects, and random assignment of subjects to either the control or experimental group (Burns & Grove, 2003). To demonstrate criteria and strengthen the study randomization of sample distribution via a blind drawing will be performed and to establish consistent control of acupressure the researcher will be solely responsible for implementing the experimental intervention.

Intended Method of Data Analysis

In replication of the original study by Chung et al. (2003) an estimated 150 participants will be randomly assigned to three groups: control group, effleurage, and acupressure. As a result of random assignment and an uneven amount of paired groups the following three non-parametric methods of statistical analysis will be utilized to evaluate data collected during this study: Wilcoxon two-sample test, Kruskal Wallis test, and Bonferroni multiple comparison test.

The Wilcoxon two-sample test also referred to as the Mann-Whitney U evaluates whether two unpaired samples are different (Munro, 2001). In a study completed by

Eccles (2005) the Wilcoxon two-sample test was used evaluate the use of static magnet therapy to ease menstrual pain. Using this method on the uneven subject groups statistical significance of p=0.056 was successful in supporting the hypothesis.

Kruskal-Wallis compares data from two or more groups. Data are converted into ranks and then compared to the mean rank in each group. This one-way analysis of variance may be used when data violate the assumptions underlying the parametric tests (Munro, 2001). A study completed by Woods, Craven, and Whitney (2005) used the Kruskal-Wallis to evaluate the effects of therapeutic touch on three groups of patients diagnosed with dementia. A significant difference in overall behavioral symptoms of dementia among the therapy group was noted ($x2 = 6.661$, p= 0.036).

To protect against error the Boneferroni Correction which involves dividing the desired level of significance by the number of comparisons to be made will be applied (Munro, 2001). A study conducted by Huang, Zhou, Lu, Tian, Li, Cao, Yu, and Wang (2007) applied repeated-measures analysis of variance with the Boneferroni method to conclude that unilateral electroacupuncture improved leg muscle strength during a four week trial.

Data collected from the open ended questions will be evaluated by the researcher. Analysis and counting will be utilized to note trends or repetition in responses (Burns & Grove, 2003). In an ethnographic study by Safadi (2005) data analysis was applied to evaluate and compare information obtained from a 120 open-ended questionnaire in regards to the perceptions and practices of pregnancy among primiparous Jordanian women. This analysis determined trends among the 67 participants which included

whether the pregnancy was planned or desired, wishes for the unborn child, and the role of family support.

Summary

The intention of this study is to assess the effect of acupressure as an alternative option to medication for pain relief during labor. The study will be an approximate replication of the study completed by Chung, Hung, Kuo, & Huang (2003). Approximately 150 participants will be evaluated in order to collect data that will validate previous research on the benefits of alternative therapies to both the mother and unborn child. Informed consent, voluntary participation, and right to withdrawal will be reviewed with all study volunteers and members of the participating institution upon IRB approval. A VAS and open-ended questionnaire will be utilized for data collection along with readings from an external tocodynamometer. An experimental design will used to evaluate the phenomena and data collected will be analyzed using non-parametric methods of data analysis.

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Literature Review Table

Source	Problem	Purpose Research Questions	Framework or Concepts	Sample	Design	Instruments	Results
1. Berkland, Cindy K. (1997).	**Problem:** An increasing number of women are looking for alternative methods to deal with pain and stress associated with labor and birth. **Purpose:** To determine whether the use of jet hydrotherapy during labor reduces the need for analgesics.	Is hydrotherapy a safe and effective alternative to pharmacologic pain management of labor?	Watson's Theory on the Science of Caring.	The sample for this study was based on self-choice of women choosing to utilize the Jacuzzi as a method of pain management since it would not be ethical to deny a patient the use of any available intervention for pain.	Quasi-experimental design. Dependent variables included the number and type of pain method used, the speed of cervical dilation, and the APGAR scores for the baby.	The instrument was a self-report evaluating the participants accepted methods of pain management both before and after labor via a semantic differential scale. There was also a multiple choice question prior to delivery examining the type of pain	Jacuzzi group used fewer analgesics and were less likely to receive an epidural as interventions for pain management during labor.

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						management methods the participant wished to utilize. Data analysis was utilized by the t-test and chi-square method to determine statistically significant differences between the two groups on the demographic variables.	
2. Browning, 2000.	**<u>Problem:</u>** Over the past two decades the use of music as an intervention for pain has	To evaluate the responses of primaparous women to music therapy during labor.	Labor pain and the use of music to promote imagery, distraction,	The sample consisted of 11 women.	Qualitative design Phenomenological research	Interviews and observation.	Music is a safe cost effective method for promoting relaxation and distraction

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	become more popular in various areas of healthcare. **<u>Purpose:</u>** The use of music as an intervention is becoming more popular in various areas of healthcare.		and relaxation.				during labor pain and compliments imagery and breathing techniques.
3. Carlton, Clark, Callister, & Stoneman (2005)	**<u>Problem:</u>** The decision-making process for laboring women can raise ethical dilemmas for the primary nurse caring for the patient when the patient chooses to deviate from their original birth plan.	Which factors influence a women's decision making process during labor and allows for success of a non-medicated birth or a change of preference to a medicated birth?	Ethical principals and practice should be applied when caring for the laboring woman to support and achieve positive outcomes centered on the patient's	33 primiparous and mulitparous women delivering term infants vaginally. Participants gave birth at three different birthing units located in	Qualitative method with an ethnographic approach. Interviews were utilized to evaluate which factors influence the decision making process among this culture of women as well as their behavior.	Ethnographic V.5 format for data analysis.	The participants of the study expressed feelings of disappointment, ambivalence, and satisfaction as a result of changes to their original birth plan. However, all of the women

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	Purpose: Evaluate which factors influence a woman's decision making process during labor, and which of these factors promote a successful non-medicated birth and/or a change of preference to a medicated birth		original birth plan.	the western United States.			agreed that the most important aspect of a change to the birth plan was a healthy newborn and this overshadowed any disappointment or doubt.
4. Chang, Chen, and Huang (2006)	**Problem:** Complementary and alternative methods of managing labor pain are becoming more accepted and sought as healthcare focuses on providing	Describe the characteristics of pain during labor with and without massage during the three phases of cervical dilation.	Labor pain and massage	60 primiparas in labor were randomly assigned; 30 in massage group and 30 in the control group	Experimental/ randomized	Pain characteristics were measured using the Short-Form McGill Pain Questionnaire	Massage can effectively decrease the intensity of labor pain only in the 1st and 2nd phase of cervical dilation, especially in terms of affective and

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	culturally sensitive and individualized care. **<u>Purpose:</u>** Describe the characteristics of pain during labor with and without massage.						evaluative descriptors.
5. Chung, Kuo, and Huang (2003)	**<u>Problem:</u>** Acupressure has been reported to be useful to both induce labor and manage labor pain. However, a lack of controlled clinical trials to validate its effectiveness has limited its dispersion in education and	Determine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor.	Traditional Chinese Medicine, acupressure, labor pain, gate control theory	A total of 127 parturient women were randomly assigned to three groups. One group received treatment, one received light skin touch, and	Experimental, Randomized, pretest/posttest	Labor pain was measured using the Visual Analog Scale and contractions were assessed by calculating the Montevideo Unit from fetal monitoring	The test group receiving acupressure experienced the most labor pain relief out of the three groups during the active phase of the first stage of labor. Acupressure did not result in more effective

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	practice. **Purpose:** To determine the effect of LI4 and BL67 acupressure on labor pain and uterine contractions during the first stage of labor.			one received no treatment.		strips.	uterine contractions.
6. Eckert, Turnbull, and MacLennan (2001)	**Problem:** Current forms of analgesia have significant side effects for the woman in labor. **Purpose:** To compare immersion in warm water during labor with traditional	Compare immersion in warm water during labor with traditional pain management options.	Clinical and psychological outcomes related to the use of water immersion during labor.	A total of 274 women randomly assigned to either the bath group or non bath group with 137 women in each group.	Experimental/randomized.	Data was collected via two sets of questionnaires; one at 24-48 hours post delivery and another 8-9 months post delivery. A Visual Analog Scale and	There were no significant differences noted among either group for labor pain, augmentation of labor, length of labor, perineal trauma, or maternal infection. Psychological

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	pain management for a range of clinical and psychological outcomes.					the Edinburgh Postnatal Depression scale were utilized to evaluate data.	assessment was also similar. There was a significant increase in the number of neonates that required resuscitation in the bath group.
7. Hantoushzadeh, Alhusseini, and Lebaschi (2007)	**Problem:** The benefits of acupuncture as an intervention for pain continue to be supported by research and clinicians. **Purpose:** To assess the effects of acupuncture on nulliparous women during childbirth with	To assess the effects of acupuncture on nulliparous women during labor with respect to pain, labor duration, and maternal acceptability.	Acupuncture and pain relief.	150 women participated in the trial. 70 in the experimental group and 74 in the control group.	Experimental design randomized trial.	Data was collected on a Visual Analog Scale upon admission, 120 minutes after admission, and every hour thereafter until delivery.	Acupuncture was found to be an effective intervention for pain relief that shortened the duration of the active phase of labor.

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	a focus on pain, labor duration, and maternal acceptability.						
8. Heinze and Sleigth (2003)	**Problem:** In the United States the epidural is the most widely used method of pain relief despite the risk of adverse side effects to the mother and infant. **Purpose:** To evaluate the differences between women who labor with or without epidural anesthesia.	The purpose of the study was to evaluate the differences between women who labor with or without epidural anesthesia.	Beliefs about pain, personal choice, and knowledge	46 women participated in the study which was completed via a popular pregnancy forum on the internet. Each woman had delivered in the prior 6 months to completing the survey. 26 of the women had received epidural anesthesia, 20 had not.	Quantitative	A three part survey was utilized to collect data during the study. The survey was distributed to participants via email. The first part of the survey collected data on demographics, the second portion of the survey evaluated feelings/beliefs regarding childbirth, and the final	The use of epidurals for pain during childbirth has a significant correlation to fear and lack of active participation during the birthing process.

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						portion evaluated knowledge regarding potential risks associated with epidural use. A Likert 1-5 scales was used as well as a point system.	
9. Lee, Chang, and Kang (2004)	**Problem:** Due to potential side-effects on mothers and fetuses, the use of analgesic agents may not be the first choice for labor pain. **Purpose:** To evaluate the effects of SP6	Evaluate the effects of SP6 acupressure on labor pain delivery time in women in labor.	Traditional Chinese Medicine, acupressure, labor pain	75 women in labor; 36 in SP6 acupressure group and 39 in the SP6 touch control group	Experimental/ randomized	Labor pain was measured using a structured questionnaire, a subjective labor pain scale (visual-analogue scale). Length of	There were significant differences between the test and control groups in subjective labor pain scores at all points following intervention. The total labor time was

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	acupressure on both labor pain and the duration of labor.					time for cervical dilation was also measured.	significantly shorter in the SP6 acupressure intervention group than in the control group.
10. Martensson and Wallin (2006)	**Problem:** The use of acupuncture and sterile water injections for labor pain in Swedish delivery wards has changed over time. The reason for this change is unclear. **Purpose:** To evaluate the use of acupuncture and sterile water	Elucidate the clinical use of acupuncture and sterile water injections as pain relief and relaxation during childbirth in Swedish delivery wards.	Labor pain, acupuncture, sterile water injection, nurse midwife	960 midwives in Sweden	Comparative descriptive	Questionnaire consisting of 34 questions	Nurse midwives in Sweden used acupuncture for both pain relief and relaxation; whereas, sterile water injections were used almost exclusively for pain relief. The results indicate a weakness in midwives' awareness and use of scientific

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	injections for labor pain and why there has been an increase in the use of acupuncture and a decrease in sterile water injections over time.						knowledge and general recommendations about these methods.
11. McCrea, Wright, and Wright 1999	**Problem:** Satisfaction with pain relief is influenced by individual and environmental factors. **Purpose:** To determine if personal control during labor effects perception of pain relief during labor	Satisfaction during childbirth is influenced by individual and environment factors.	Personal Control, labor pain, and satisfaction of birth experience.	146 women in Northern Ireland.	Qualitative	Questionnaire and Visual Analog Scale	A significant relationship between personal control variables and pain relief. The author's also note the importance of emphasis being placed on the value of a woman's own coping resources versus pain

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							medication and the resulting correlation of satisfaction with pain relief and overall birth experience.
12. Peart 2008	**Problem:** Limited choices for pain management are available to the laboring woman due to professional and economic constraints. **Purpose:** To investigate whether intradermal sterile water injections provided an alternative method to	Investigate alternative methods for pain relief that may be more cost effective and carry fewer adverse side effects.	Intradermal sterile water injections and the relief of back pain during labor.	60 women in Australia.	Experimental design	Questionnaire and Visual Analog Scale.	Intradermal sterile water injection is a safe and effective non-pharmacologic intervention for back pain during labor based on the data collected by Peart (2008). Further education is required among practitioners to support the use of sterile water injections

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	managing labor pain that may have fewer side effects.						among laboring women.
13. Salem, Safaa Gaber (2004).	**Problem:** Pharmacologic methods for pain management during labor are not always an option. **Purpose:** To examine the physiologic effect of music as an intervention during labor.	Do women who use music during the first stage of labor have less sensation of pain than those who do not? Do women who use music during the first stage of labor have less anxiety of pain than those who do not?	The identified concepts of this study include music, pain, relaxation, and distraction. The study's framework was based on the Gate Control Theory for pain.	74 women ages 20-35 in the first stage of labor from Alexandria Egypt. The 74 participants were randomly assigned to the music or control group with each group consisting of 37 subjects.	This study was based on an experimental design using repeated measures to evaluate the effect of music on sensory and affective pain during the first stage of labor.	To measure the sensation of pain and level of anxiety the researcher utilized the Sensation of Pain Visual Analog Scale (VAS). Subjects were asked to place a pencil mark on a 10cm horizontal line, which was labeled "no pain" at one end and "worst pain imaginable"	Fifty-one percent of the test subjects in the music group indicated that they utilized the music to distract them from the pain and relax before and during contractions. Thirty percent indicated that music was only used to relax in between and during contractions and nineteen percent only

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						at the other, after each contraction. This mark was to represent the level of pain and anxiety felt after each contraction. The distance between the left end of the line was then measured and recorded in millimeters.	used the music as a distraction from the contractions. Ninety-two percent of the subjects agreed that music did help to reduce the pain while the remaining eight percent were undecided. Data indicated that the music group indicated less anxiety and pain overall in comparison to the control group during the first stage of labor.